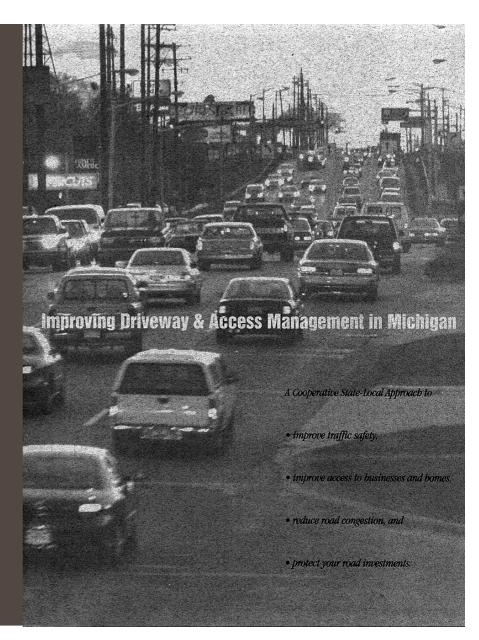


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## Introduction

This booklet is presented by the Michigan Department of Transportation (MDOT) as a service to local planning and elected officials, transportation agencies, private developers and other interested parties.

The intent of the booklet is to promote and support cooperative efforts of MDOT and local agencies to better manage access between community development and the state highway system. This process is referred to as "Access Management."



## **How to Use This Booklet**

Pages 1-5 explain the concepts of access management and its benefits to motorists, property owners and to your community.

Pages 5-7 provide in depth explanations of key techniques employed in access management that improve transportation operations in a community. These should be considered by local planning officials and developers as preliminary site plans are being discussed.

Pages 7-12 focus on MDOT's current driveway permit program and a framework for coordinating driveway permits with local development approval procedures. Developers, local planning and elected officials, and representatives of transportation agencies may be interested in these pages.



# **What is Access Management?**

Access management is defined as "a process that provides or manages access to land development while simultaneously preserving the flow of the traffic on the surrounding road system in terms of safety, capacity and speed."

As communities grow, it is sometimes difficult to get the most value from each parcel of land as it is developed. For example, property that does not abut a public street or highway is referred to as "landlocked." The value of the landlocked property is usually much lower than property with direct access to a public road or street. On the other hand, parcels with driveways too close to an intersection are not easily accessed if traffic frequently backs up and blocks the entrance. Clearly, property has a much higher value if its driveway locations are well planned and designed.

So the goal of access management is to achieve a safe and efficient flow of traffic along a roadway while preserving reasonable access to abutting properties. Achieving this goal requires a careful balancing act in the application of access design standards and regulations.



# Where is Access Management Used?

The need for better access management is most obvious in strip commercial areas where driveways are found every few feet. Too many driveways can confuse drivers, who become uncertain as to when turns into or out of driveways will be made. Too many driveways result in a large number of turning movements and conflict points, increasing the potential for traffic accidents. In addition, when there are no turn lanes, each turning vehicle slows traffic and reduces the carrying capacity of the road. Unfortunately, once an access management problem is obvious, it is often too late to correct. By managing access to the highway system during project planning stages, safe access can be provided while preserving traffic flow.

Access management can benefit properties in all communities and along all types of roads. Access management principles have been a part of roadway design for many years. For example, freeways function to move large volumes of traffic at high speeds for long distances because access is limited. In contrast, residential streets function only to provide access to homes.



The key to effective access management is linking appropriate access design to roadway function. Successful access management protects and enhances property values while preserving the public investment in our roads.

The principal design techniques used in access management focus on the control and regulation of the spacing and design of:

- " driveways and streets,
- " medians and median openings,
- " traffic signals, and
- " freeway interchanges.

#### Goals of Access Management

"safe and efficient flow of traffic along a roadway while preserving reasonable access to abutting properties."



# **Benefits of Access Management**

Transportation officials and planners are showing more interest in access management because of increasing traffic congestion, traffic safety issues, and the rising costs of road improvements. Good access management can:

- reduce crashes and crash potential,
- " preserve roadway capacity and the useful decrease travel time and congestion,
- " improve access to properties,
- " coordinate land use and transportation decisions,
- " improve air quality, and
- " maintain travel efficiency and related economic prosperity.



#### Reduce traffic crashes and crash potential

For more than two decades, various studies have documented how good access management can significantly reduce the number of traffic crashes, including fatal, injury and property damage crashes.

Studies in Colorado and Florida have shown that the crash rate can be 50 percent less on good access management roads. In Georgia, installing medians with protected left turn lanes decreased crashes by 25 percent, while similar measures reduced crashes by 45 percent in New Jersey. In a 1988 Michigan study, there were half as many crashes on four- or six- lane divided highways as there were on undivided four- and six-lane roads. Other studies typically have found 30 percent to 45 percent fewer crashes on roads with access management improvements.

In Michigan, there were nearly 390,000 crashes in the three-year period from January 1, 1992 to December 31, 1994. If crashes on limited access facilities are excluded from the count, there were nearly 318,000 in the three-year period. Nearly 68 percent of these crashes are access related, having occurred at intersections or driveways (including driveways in interchange areas). More than 33,000 crashes in the three year period were recorded as driveway related, accounting for 69 fatalities and nearly 13,900 injuries. The average annual cost associated with these driveway-related crashes, based on National Safety Council more than \$220 million.





With more than 11,000 driveway related crashes in Michigan each year, better access management can improve motorist safety and reduce injury crashes and automobile repair expenses.

Statewide Summary of Reported Driveway Related Traffic Crashes				
YEAR	FATAL.	INJURY	PROPERTY DAMAGE	TOTAL
January 1,1992 To December 31,1992	13	2,014	5,634	7,661
January 1,1993 To December 31,1993	23	3,664	9,223	12,910
January 1,1994 To December 31,1994	30	3,478	9,231	12,739
TOTAL	66	9,156	24,088	33,310

The table shows the number of crashes resulting in fatalities, injuries and property damage on MOOT trunklines. Actual number of persons involved is as follows:

- Number of persons killed = 69
- Number of persons injured = 13,855



# Preserve roadway capacity and useful life of roads

Congestion angers motorists, prevents roads from functioning as they were designed, and is a source of air pollution. One major contributor to congestion is unnecessary or uncontrolled points of conflict caused by too many opportunities to turn onto or off the road. As cars slow to turn, the capacity of the road to move cars at the posted speed is diminished. Stated another way, poor access management and too many driveways contribute to the functional deterioration of a road. Good access management preserves a roads capacity to move vehicles at the posted speed and extends the useful life of the road. A Florida Department of Transportation study found that the typical fourlane arterial road with good access management can handle almost 10,000 more vehicles per day than the same four-lane road with poor access management.



#### **Decrease travel time**

Good access management helps motorists get to their destinations with fewer delays. How? Vehicles tend to travel closer to posted speeds on roads where access is managed. For example, a comprehensive Colorado study showed conclusively that delays were considerably less during peak hours on roads with good access management.

A Florida study found that travel delays decreased between 8 percent and 76 percent during peak travel hours after half the median openings were closed.



#### Improve access to property

Good access management programs provide uniform standards and procedures, and promote their fair and equal application. The quality of site access and the protection of private investments are more than a function of the number of driveways. They also depend on the design and spacing of driveways, the ease and safety of pulling off or onto a road, distance from intersections, and traffic signal sequencing. Highly managed site access results in a carefully designed and safe means of access to each property. In some cases this may not be direct access from a major arterial, but controlled access from a side street or frontage road. Businesses with safe and easy access are more inviting to shoppers and visitors, and are the scenes of fewer traffic crashes.

Source: Colorado Access Control Demonstration Project, 1985.



# Coordinate land use and transportation decisions

Approving new developments without adequately managing access guarantees future conflicts and reduced road capacity. In contrast, land use decisions that are coordinated with access management usually assure quality developments that protect the public's investment in roads and streets. These benefits occur only if a coordinated review takes place between the transportation and local land use approving authorities. Too often, land development approval is given without coordinating with the responsible transportation agency.

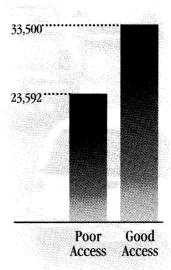


### Improve air quality

When traffic moves smoothly, vehicles burn fuel efficiently and generate less air pollution. Since the bulk of air pollutants in most urban areas are auto and truck related, efficient road systems can significantly reduce air pollution. Frequent slowdowns and stops greatly increase fuel consumption and, hence, air pollution. Roads with poor access management often cause frequent slowdowns and stops, while a steady traffic flow occurs on roads with good access management.

#### **Increased Capacity**

A typical four-lane arterial road with good access management can handle nearly 10,000 more vehicles per day.

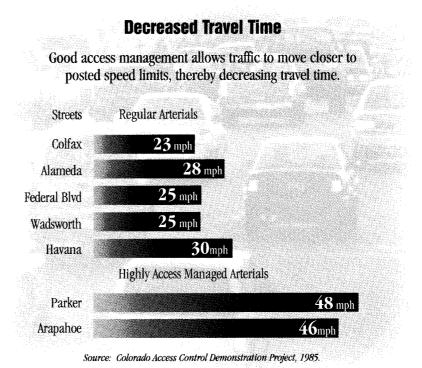


Source: Florida Department of Transportation.



# Maintain travel efficiency and related economic prosperity

Economic prosperity depends on a safe and efficient transportation system. A well designed access management program can greatly contribute to a safe and efficient transportation system, which is key to every community's economic base.





#### **Access Management Benefits:**

Motorists: by reducing traffic crashes and congestion, and decreasing travel delays.

Land Owners: by increasing economic development potential of land associated with an efficient transportation system, and enhancing property values by decreasing travel time that extends market areas.

Developers: by establishing access design criteria in advance, thereby preventing the high cost of delay and redesign.

The Public: by prolonging the functional life of existing roads. By maintaining or increasing a road's design capacity, funds that might otherwise have to be spent for expensive road widenings can be spent on road maintenance and operations.



#### **Consequences of Not Managing Access:**

- The efficiency of our transportation system will deteriorate, and traffic and land use conflicts will increase.
- Poorly planned strip commercial development will be encouraged.
- The number of private driveways will proliferate.
- More driveways mean more traffic conflicts, crashes and congestion.
- The publics investment in Michigan's roadways will be diminished.
- Roads will have to be widened at great public expense to make up for capacity lost to inefficient traffic operations.
- The incompatibility of providing land service and traffic service will become more severe.
- Neighborhood streets will be used to bypass congested intersections.

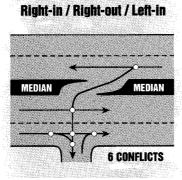


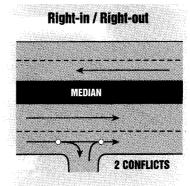


# **Basic Principles of Access Management**

Six basic principles are used to achieve the benefits of access management:

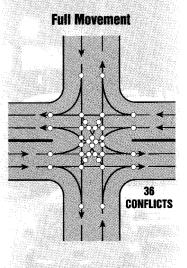
- Limit the number of conflict points.
- Separate conflict points.
- Separate turning volumes from through movements.
- Locate traffic signals to facilitate traffic movement.
- Maintain a hierarchy of roadways by function.
- Limit direct access on higher speed roads.





# Limit Conflict Points Good access design can reduce the

number of conflict points and traffic crashes.





## Limit the number of conflict points

When the number of potential conflict points between turning vehicles increases, so do the opportunities for traffic crashes. Intersections typically have the most points of potential conflict. For example, there are 36 conflict points (22 if signalized) where a four-lane road intersects with a two-lane road. A driveway that provides access across a median as well as to the abutting road has six points of potential conflict, while a driveway with only right-turn-in and right-turn-out has just two points of potential conflict.

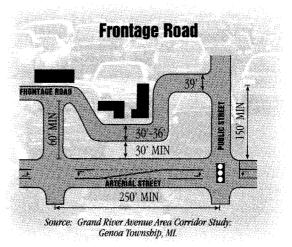
Good access management techniques can reduce the number of conflict points. Medians eliminate many conflict points by limiting opportunities for left turns. Directional median openings can also safely provide for controlled access with few conflict points. When medians are used, nearly every driveway becomes right-in and right-out only with just two conflict points.

A business with three driveways on a typical four lane road (without a median) produces numerous conflict points. Reducing three driveways to one achieves a 66% reduction in conflict points. Fewer driveways also means there is more space for good design for the remaining driveway.



## **Separate Conflict**

Traffic conflicts can also be reduced by separating conflict points. Effective ways include establishing minimum distances between intersections and driveways and establishing corner clearance standards that separate driveways from the critical approach areas of intersections. Each of these techniques permits a longer, less cluttered sight distance for the traveling motorist, which increases traffic safety. More separation distance also gives motorists a longer reaction time. A 10 mph speed differential is desirable to give motorists adequate time to react. To achieve this goal, minimum separations between driveways should be 93.2 meters (300 feet) on roads with 35 mph speed limits, 130.5 meters (420 feet) on roads with 40 mph speed limits, and 170.9 meters (550 feet) when the speed limit is 45 mph. Higher traffic speed requires greater driveway separation. A single driveway can serve multiple businesses if a frontage road is used.



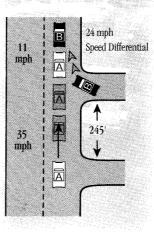


# Separate turning volumes from through movements

Vehicles typically slow before turning. When turning vehicles are removed from the main flow of traffic, traffic speed is better maintained. In addition to maintaining speed, roadway capacity is preserved and accident potential is reduced. The differences in speed between through vehicles and turning vehicles is also reduced, which also creates safer driving conditions. Separate right and left turn lanes, carefully spaced median openings, and frontage roads are access management design tools that serve this purpose.

#### **Speed Differential**

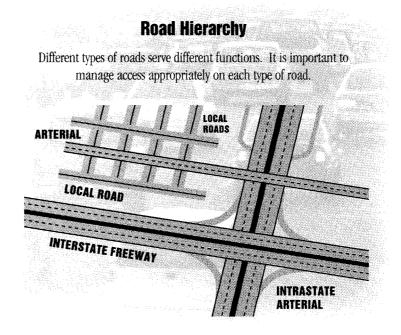
The more space between driveways and access points, the less speed differential there will be. This increases safety.





# Locate traffic signals to facilitate traffic movement

When an arterial road has poorly spaced and uncoordinated signals, traffic safety, road capacity and traffic speed can be severely hampered. Distances of one-half mile or more between signals are desirable. Good access management includes evaluating signal spacing and developing a program to maintain or change spacing or signal progression to achieve safety, travel speed and capacity objectives.





### Establish a hierarchy of roadways

Most communities have a variety of roads designed to function in different ways. Few communities, however, recognize the significance and value of preserving the investment in a particular roadway function.

The illustration at the bottom of page 6 shows a typical road hierarchy. Access is most limited when the principal function of the road is high speed, high volume or long distance travel. In contrast, the primary function of local roads (such as in residential neighborhoods) is to provide access to abutting properties. Arterial and collector roads are traditional roadways between these two extremes. Access management standards consistent with roadway function protect investments in existing roads, businesses and residential areas. When a road combines high traffic volumes with too many conflict points, roadway function and quality decline, along with the ability to safely access abutting properties.



## Limit direct access on higher speed roads

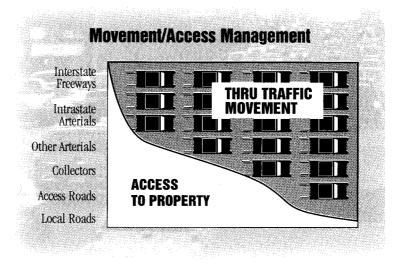
The greatest benefit of access management is preserving the functional integrity of high speed, high capacity roads. This benefit is achieved, of course, by limiting direct access to these roads. By permitting access only at signalized intersections or other public streets along the road-rather than at each abutting property-the public investment in the road is best preserved. Fewer road widenings will be needed in the future, traffic speeds will be maintained, and crashes will be reduced. Providing direct access to these roads essentially confers a private benefit at great public cost. Only where no other alternative exists, should such a benefit be conferred. Michigan law requires reasonable access to abutting property, but does not require direct access. Freeways are the best example of this principle.



# Existing State, county & Local Access Management Programs

Good access management is frequently achieved when state and local units of government cooperate in land use and transportation management decisions. There are many examples of access management cooperation between state and local governments in Michigan, and opportunities exist for even greater cooperation.

To best understand how state and local governments can cooperate in the access management process, it is important to be familiar with MDOT's driveway permit program, and similar county road commission programs. It is also important to understand how the permit review process can be coordinated with local access management decisions.





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#### **Highway Markers**

A trunkline is any highway or road under the jurisdiction of the Michigan Department of Transportation, and is generally marked with one of these symbols



U.S. routes



State "M" routes



Interstate freeways



**Business routes** 



## **MDOT** driveway permit program

By law (Act 200 of the Public Acts of 1969), property owners must obtain permission to connect a driveway to a public road or highway from the authority with jurisdiction over the road or highway. Administrative rules adopted for Act 200 establish procedures and restrictions for connecting driveways to state highways. State trunklines, which total about 9,300 miles, are generally marked with the symbols in the chart on the right.

Property owners seeking a permit to connect a residential or commercial driveway to a state trunkline must apply for a permit at one of MDOT's district offices. The permit application must be accompanied by a drawing or plan showing the proposed driveway's location, dimensions and surface type. Drainage design for storm water run off from the parcel of land is also an integral part of the driveway design and must be addressed as part of the driveway permit application.



MDOT's review process depends on the nature of development where the driveway is to be placed and the type of highway involved. More complicated driveway permit requests require longer review because they are a higher generator of traffic that will impact the capacity of the highway. MDOT encourages permit applicants for large developments to consult the appropriate MDOT district office for design and geometric details at the earliest possible date. An acceptable reference to help determine the number of trips and the expected traffic impact that will be generated by the development is a 1994 report titled "Evaluating Traffic Impact Studies, a Recommended Practice for Michigan Communities," produced by the Tri-County Regional Planning Commission (in Lansing), the Southeast Michigan Council of Governments (in Detroit), and MDOT.



The driveway permit application process generally is as follows:

- A property owner or developer applies for a driveway permit using the appropriate permit form. The application includes a preliminary site plan indicating the proposed driveway locations, original ground elevations, and if determined necessary by the MDOT district office, a trip generation study.
- The permit application and site plan are reviewed for:
- required information,
- potential environmental conflicts,
- geometric design, safe sight distance, and provisions for construction,
- drainage design and any long-term effects on maintenance operations,
- impact of the permit application on any proposed MDOT project in the same area, and
- compliance with the permit fee schedule, bond and insurance requirements control during
- MDOT determines if advance and/or final inspections are needed.
   If an inspection is needed, the permit applicant may be required to pay the cost.
- The application is approved, approved with conditions, or denied.



MDOT may stop any driveway construction for which a permit is required if the provisions of the permit are not satisfied, or if an individual fails to obtain the proper permit. Permit applicants may be liable for any costs incurred by MDOT while correcting a failure to comply with the terms and conditions of a permit, or failure to obtain a permit.

MDOT has nine district offices throughout the state. District offices are responsible for accepting, reviewing, and issuing driveway permits.

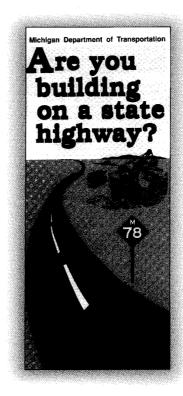
Some very large projects require the involvement of MDOT staff in Lansing. In those instances, the final decision regarding design and permit reviews are made jointly by MDOT's Lansing and district offices. Permit enforcement, while typically the responsibility of district offices, may also involve the state Attorney General's (AG's) office.

The MDOT brochure illustrated on this page describes the driveway permit program. For a copy, please contact an MDOT district office.



## **County driveway permit programs**

Michigan's county road commissions maintain more than 85,000 miles of roads. Most county road commissions also administer driveway permit programs-similar to MDOT's —for all county roads within their county. Driveway permits are issued from the county road commission main office. Permit review focuses on driveway design, drainage and sight distance. Interest is growing among county road commissions in adopting standards relative to driveway separation, number of driveways or similar access management standards.





#### **Local access management programs**

More local governments in Michigan are developing access management programs. Many new access management efforts are being proactively adopted to head off problems before they occur. This is an important point: the best access management programs are launched before problems develop, thereby reducing traffic crashes and preserving existing road capacity. Local access management programs range in sophistication from simple standards that separate and reduce the number of new driveways, to requirements for shared driveways and frontage roads, to remediation programs in areas where access-related problems are severe. Most local access management requirements are embodied in zoning regulations and are based on corridor access management plans.



# Relationship to local land development approval procedures

A critical part of access control is the land use authority of Michigan's local units of government. While MDOT and county road commissions are responsible for most roads and streets, land use decisions are most often made by local governments.

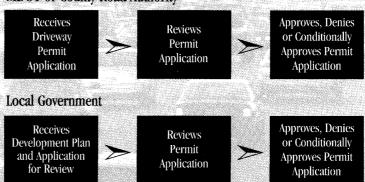
Local planning, zoning and elected officials are the community land use decision-makers. They ensure new development is consistent with local lend use (or master) plans, compatible with other land uses in the community and in compliance with local regulations. These local officials are responsible for assessing the affects of land use decisions within their community's borders, but not beyond. The local development review process is often segregated-in other words, local officials often review development plans without consulting the road agency (city, county or state) responsible for managing access in their area.





#### **Separate Review & Approval Processes**

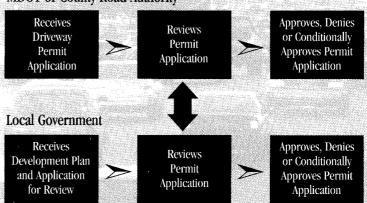
**MDOT** or County Road Authority



Where there is little or no coordination, chances for problems increase.

#### **Coordinated Review & Approval Processes**

**MDOT or County Road Authority** 



In a coordinated process, comments are shared before final decisions are made.



Through zoning, subdivision regulations, condominium regulations, private road regulations, and building codes, local governments can approve new developments with or without considering the impact on access.

Many local governments may not be well informed of MDOT's drive-way permitting requirements or those of the county road commission. They also may know little about how development decisions affect the safety and function of state highways and county roads. Moreover, the process of access permitting often does not occur until after the final land use decision is made. As a result, road agencies often have little, if any, input into the land use decisions. This can result in frustration among all participants if project design changes are needed —after the final land use decision is made— to obtain a driveway permit. If access problems are identified too late in the process, some solutions that may have worked earlier in the design stage may no longer be options.

Simply involving MDOT or the local road agency early in the process of planning and reviewing a development can produce many benefits. Access related issues can be raised earlier and solutions more easily found.



No laws or regulations require local planning, zoning and building permitting agencies to coordinate their efforts with MDOT and/or county road commissions. Some local governments have worked out informal procedures with MDOT district offices or county road commissions. In these instances, it is usually because the local government has professional staff or consultants able and available to coordinate the process.

The chart on page 9 shows the typical segregated project review procedures used by local governments and road agencies. Also included is an alternative procedure used in some communities that coordinate development reviews with road authorities.



# OPPORTUNITIES FOR COORDINATED ACCESS MANAGEMENT

Better project review coordination between state and local governments leads to better access management. Better access management allows motorists to conveniently and safely access their homes and local businesses with fewer delays.

If local permit procedures were coordinated with MDOT and county road commission driveway permit procedures, many access conflicts could be avoided.



#### Benefits of coordinated decision making

Coordinated land use and access management decision-making can:

- prevent conflicts involving the community, developer, and a road authority created because: 1) a driveway permit was issued by MDOT or a road commission before local site plan review has been completed; 2) the community approved a site plan or building permit before determining if a driveway permit has been issued by MDOT or the county road authority.
- build a professional relationship based on a common understanding of local road issues, which in turn can improve cooperation and mutual support on future maintenance, remedial and/or improvement projects.
- prevent unnecessary redesign, which typically results in higher development costs.



### Basic elements of coordinated decision making

The key elements of coordinated decision making are:

- all relevant government agencies reviewing proposed projects at the same time,
- compatible standards, and
- conditioning approval of each permit on receipt of required permits issued by other approving authorities.

Coordinated decision-making requires MDOT or county road commission review of proposed site plans for most projects at the same time they are being reviewed by local zoning authorities. Very large projects should go through a two-step review process, where the developer meets with the road authorities and local government officials early in the project design process. At the discretion of local officials, these preliminary site plan review meetings should be conducted together with the appropriate road authorities.

If local zoning authorities have no access management standards, compatibility of standards is not an issue. But if there are local access management regulations, and they conflict with the road agency's standards, then in most cases, the developer must comply with the most stringent regulations of both the community and the road agency. If the responsible road authority is not aware of local standards, they could issue a driveway permit that is inconsistent with local requirements.



By conditioning local site plan approval on receipt of required permits from the responsible road authority, the local government will assure compliance of the project with state and/or county road standards. Similarly, MDOT and county road commissions that condition approval of their permits with local land use standards will help assure new development does not violate local zoning and related requirements.

Coordination between road authorities and local land use authorities is the best way to ensure that future land use decisions protect motorists and the public's investment in Michigan's highways. Coordinated access management reduces traffic crashes and congestion, provides people easy access to and from homes and businesses, allows roads to carry the volume of traffic they were designed for, and helps communities grow and prosper.



# **Acknowledgment**

This brochure was produced by the MDOT consultant team of Urbitran Associates, the Planning and Zoning Center, and Rossman & Associates.

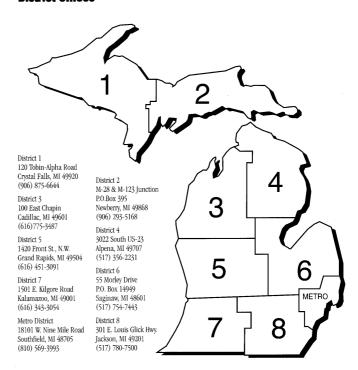
The authors would like to recognize the contributions of Frank Koepke and Herbert Levinson, whose unpublished brochure— "Access Management: A Key to Mobility" (1994) contributed to this booklet.

We also would like to recognize the contributions of access management publications of the Florida, Colorado, and New Jersey Departments of Transportation.





#### Michigan Department of Transportation District Offices





Providing the highest quality transportation services for economic benefit and improved quality of life.

This document was prepared for the Michigan Department of Transportation. Preparation of this document was financed, in part, by funds from the United States Department of Transportation and the Michigan Department of Transportation. The opinions and/or recommendations expressed in this brochure are those of the authors and not necessarily those of the Michigan Transportation Commission or the United States Department of Transportation or their agencies.



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Reduce traffic crashes and crash potential

Preserve roadway capacity and useful life of roads

Decrease travel time

Improve access to property

Coordinate land use and transportation decisions

Improve air quality

Maintain travel efficiency and related economic prosperity

#### **Basic Principles of Access Management**

Limit the number of conflict points

**Separate Conflict** 

Separate turning volumes from through movements

Locate traffic signals to facilitate traffic movement

Establish a hierarchy of roadways

Limit direct access on higher speed roads

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County driveway permit programs

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Benefits of coordinated decision making

Basic elements of coordinated decision making

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